



# SPECIAL AIRWORTHINESS INFORMATION BULLETIN

Aircraft Certification Service  
Washington, DC

U.S. Department  
of Transportation

**Federal Aviation  
Administration**

CE-05-77  
July 27, 2005

<http://www.faa.gov/aircraft/safety/alerts/>

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*This is information only. Recommendations aren't mandatory.*

## Introduction

This Special Airworthiness Information Bulletin (SAIB) advises you, owners and operators of **Cirrus Design Corporation (CDC) Model SR20 or SR22 airplanes**, of possible loss of left or right braking.

## Background

We have two known occurrences in 2005 of leaking hydraulic fluid from the right brake caliper. One airplane lost directional control and hit another airplane. In the other occurrence, the hydraulic fluid caught fire at the caliper causing significant fire damage.

## Discussion

Examination of these brakes has shown discoloration of the calipers due to heat and hydraulic fluid leaks at the caliper piston. We believe the piston seal temperature was too hot. Helical propwash with a free castering nose wheel leads to occasional right braking during taxi for directional control. This may result in more heat and wear on the right pads than on the left, especially if you do not follow proper operating procedures such as use of rudder during taxi.

Cirrus has issued Owner Service Advisory No. SA 05-04 dated June 30, 2005, (attached) which includes operating procedures to avoid brake damage or failure due to excessive heat and inspection procedures to detect damaged or severely worn brake components.

## Recommendation

The current preflight walk-around in the Pilot's Operating Handbook includes an inspection of the wheel and brakes for "Fluid Leaks, Condition, and Security". We recommend the preflight walk-around include **a close inspection of the ground and wheel fairing of each main gear for leaking hydraulic fluid (as stated in the service advisory)**.

## For Further Information Contact

Wesley Rouse, Aerospace Engineer, FAA  
Chicago Aircraft Certification, 2300 E. Devon,  
Des Plaines, IL 60018; phone: (847) 294-  
8113; email: [wess.rouse@faa.gov](mailto:wess.rouse@faa.gov)

**You Can Read** the service advisory on line at [www.cirrusdesign.com](http://www.cirrusdesign.com) under "Service & Upgrades" – Service Publications".



# **Owner Service Advisory** SA 05-04

Issued: 30 Jun 2005

Models SR20 and SR22

**TO:** Owners, Operators, and Service Centers

**SUBJECT:** Proper Braking Practices

**EFFECTIVITY:** Cirrus Design SR20 serial numbers 1005 and subsequent.  
Cirrus Design SR22 serial numbers 0002 and subsequent.

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**WARNING:** Excessive brake application during taxi can lead to brake overheating which can cause brake damage or failure. Brake damage or failure may result in loss of directional control and possible aircraft damage or personal injury.

The brake systems installed on the SR series aircraft are not unique to Cirrus. Other aircraft, including free-castoring nose wheel designs, employ the same brake design with high reported reliability. However, no brake system is immune from the overheating of brakes due to aggressive or improper use.

Cirrus aircraft rely on differential braking for directional control while taxiing; therefore, proper braking practices are critical to avoid potential damage to the brakes.

Pilots unaccustomed to free castoring nose wheel steering may be inclined to use the brakes excessively for steering. Good practice is to use full rudder input prior to applying brakes to supplement steering.

The most common cause of brake failure is the creation of excessive heat through improper braking practices. *Riding brakes while taxiing is similar to driving with one foot on the brake and one foot on the gas.* This causes a continuous build up of energy that would otherwise be moving the airplane.

Excessive heat causes warped brake rotors, damaged or glazed linings, damaged o-rings, and vaporized brake fluid. To avoid brake failure, observe the following operating and maintenance practices:

1. The brakes should always be checked prior to startup and again prior to taxi. Refer to Chapter 4 of the POH for preflight inspection of wheels and brakes.
2. The brake fluid reservoir, brake linings, and brake condition should be inspected every 50 flight hours. Refer to the Airplane Maintenance Manual or Chapter 8 of the POH for these recommended maintenance and inspection intervals.
3. Verify that the parking brake is completely disengaged before taxi.
4. Use only as much power (throttle) as is necessary to achieve forward movement. Any additional power added with throttle must be absorbed in the brakes to maintain constant speed.
5. The rudder is effective for steering on the ground and should be used.
6. Use the minimum necessary brake application to achieve directional control.
7. Do not ride the brakes. Pilots should consciously remove pressure from the brakes while taxiing. Failure to do so results in excessive heat, premature brake wear, and increased possibility of brake failure.
8. Avoid unnecessary high-speed taxiing. High-speed taxiing *may* result in excessive demands on the brakes, increased brake wear, and the possibility of brake failure.

**Cirrus Design Corporation**

4515 Taylor Circle  
Duluth, Minnesota 55811  
PH (218) 727-2737

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Cirrus Design Corporation cannot be responsible for the quality of work performed by others while fulfilling the requirements of any service bulletin. Procedures specified in service bulletins must be accomplished using industry standard maintenance practices and applicable government regulations.

Cirrus Design  
**Service Advisory**

9. Avoid heavy braking or rapid deceleration from high-speed landing. Landings should always be made with full flaps. Deceleration from 85 knots to a full stop is *double* the energy of decelerating from 60 knots to a full stop.
10. Brakes have a large energy capacity; therefore, cooling time should be considered. Energy absorbed during a few seconds of deceleration can take up to an hour to dissipate. Always allow adequate cooling time after brake use.

The aircraft should not be operated with overheated, damaged, or leaking brakes. Conditions include, but are not limited to:

1. Leaking brake fluid at the caliper. This can be observed by checking for evidence of fluid on the ground or deposited on the underside of the wheel fairing. Wipe the underside of the fairing with a clean, white cloth and inspect for red colored fluid residue.
2. Overheated components, indicated by discoloration or warping of the disk rotor. Excessive heat can cause the caliper components to discolor or cause yellowing of the part identification label.
3. The brake linings may be inspected periodically with the wheel fairings in place. With the use of a small mirror, this can be accomplished during the preflight inspection.

Cirrus has performed several tests both during initial certification and recently to better quantify the brake system performance and cooling under certain conditions. The following is a summary of those tests:

1. The brake system has adequate energy capacity and exceeds the regulatory requirements for brake performance.
2. Under normal use conditions, the brakes do not have a tendency to overheat.
3. The most significant cause of overheating is excessive use during ground operations.
4. The brake system has proven very reliable and robust, where most operators report no problems.

For additional assistance, please contact your local service center or Field Service Technical Support.

Phone: 1-800-279-4322

E-mail: [fieldservice@cirrusdesign.com](mailto:fieldservice@cirrusdesign.com)